

NOTES ON THE NESTING BEHAVIOR OF *EREMNOPHILA BINODIS* (HYMENOPTERA: SPHECIDAE)¹

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ABSTRACT: This paper presents observations on the nesting behavior of *Eremnophila binodis* in a tropical rain forest in southern Brazil. These observations deal mainly with the digging of the nest and its temporary closure. The behavior of this species is essentially similar to that of other species of *Eremnophila* and some species of *Ammophila*.

The genus *Eremnophila* Menke was first proposed as a subgenus of *Ammophila* Kirby (Menke 1964) and elevated to genus status later (Menke 1966). This genus has nine species distributed in the Neotropical region (Menke 1964). The biology of species in the genus *Eremnophila* is poorly known, the published data limited to a few short notes on some species (Richards 1937, Evans 1959, Genise 1981). Herein I present observations about the nesting behavior of *E. binodis* (Fabricius).

The studies on *E. binodis* were carried out in the Biological Reserve of Poço das Antas (20° 30' S and 42° 15' W), Rio de Janeiro, in southern Brazil. The vegetation of this area consists of well preserved tropical rain forest (Atlantic forest). The summer is the hot, rainy season, and the temperature reaches 42°C. The winter is the colder and more dry season, but the temperature is always above 20°C.

During 1995 and 1996 I observed several specimens of *E. binodis* along unpaved roads, hovering near vegetation and collecting nectar from herbaceous plants like *Borreria* sp. (Rubiaceae). However, their nests were not easily discovered, probably because females usually nest beneath clumps of vegetation. Some wasps were seen in copulation resting on plants or flying around, but I was not able to find their nests.

On May 12, 1995, I found a female while she was digging her nest beneath small tufts of grass in the midst of a dirt road where the soil was very compact. She bit off lumps of soil with her mandibles, accumulating them between her mouthparts. She repeatedly flew off about 30-40 cm, always using a similar trajectory, and dropped the lumps of soil on the same spot. While digging the soil she emitted an easily audible buzzing sound. She dug a cylindrical nest, 1 cm in width and 5 cm in depth. After digging the burrow the female closed it

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temporarily. The temporary closure consisted of two small leaves, small pebbles, and some earth scuffed over the top. First she placed the leaves inside the burrow. These were used to support the pebbles and the earth. She packed the last with the oral surface of her head, with her mandibles open. The wasp then added a small pebble on the nest entrance and flew away. When the female departed, I removed the closure so that I could observe in detail the construction of a new temporary closure when she returned. First she placed a small dry leaf collected on the ground far away from the burrow, even though there were several other apparently similar leaves around the nest entrance. Soon after collecting the first leaf, she obtained four more leaves that she collected beside her nest. The first leaf was apparently collected away from the nest because she had to select an object capable of supporting the other ones efficiently. After arranging the leaves inside the nest she brought a large pebble with her mandibles. She could hardly carry this pebble after a set of short flights. She deposited then another smaller pebble and started scooping with her forelegs, throwing little lumps of earth behind her. She interrupted the digging twice. The first time, she added two more small pebbles into the nest. The second time, she put in another leaf. The earth excavated formed a mound beside the burrow which the wasp pushed towards the nest entrance all at once. The overall process of closure took seven minutes. Once the closure was done, the wasp flew off, possibly to search for prey. Another day a female was observed carrying a notodontid caterpillar over the ground, holding it with her mandibles.

Other species of *Eremnophila* build temporary closures with materials similar to those of *E. binodis*. Richards (1937) observed a female of *E. opulenta* Guérin temporarily closing the nest with plant debris. Evans (1959) found a female of *E. aureonotata* Cameron using a single dried leaf as a temporary plug. However, in order to build the final closure, *E. aureonotata* used lumps of earth and bits of leaves and scraped the soil into the burrow with her forelegs. Genise (1981) observed *E. eximia* (Lepeletier) using small pebbles, plant debris, and sand to temporarily close the nest. The digging behavior and the structure of the temporary closure of the nest of *E. binodis* are quite similar to those of some species in the genus *Anmophila* (Evans 1959, Powell 1964), which is closely related to *Eremnophila*. Caterpillars from the following families have been recorded as prey for females of *Eremnophila*: Hesperidae (Richards 1937), Notodontidae (Evans 1959), and Sphingidae (Genise 1981).

Voucher specimens of *Eremnophila binodis* have been deposited in the collection of the Department of Zoology of the Museu Nacional/Universidade Federal do Rio de Janeiro.

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SOCIETY MEETING OF MARCH 24, 1999

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DRAGONFLY AND DAMSELFLY DIVERSITY IN THE SOUTH-CENTRAL U.S.

Dr. Abbott began by explaining that the south-central United States serves as an important biogeographical link and dispersal corridor between Nearctic and Neotropical elements of western hemisphere odonate faunas. The species are reasonably well known because of substantial collections, but there had never been a concerted effort to document the extent of biodiversity and possible geographic affinities of dragonflies and damselflies in this region. Dr. Abbott then gave a brief review of the diversity of Odonata in the region including some of the species that have been added to the region's fauna since the conception of this study five years ago. These included 13 previously unreported species from Texas, including five new to the U.S. and one species each to the Louisiana and Oklahoma faunas.

Dr. Abbott has documented a total of 12,515 records of Odonata found in 408 counties within the south-central U.S. A total of 73 species of damselflies and 161 species of dragonflies have been documented in the region. The 234 (198 in Texas) Odonata species are distributed among 10 families and 66 genera.

Dr. Abbott then went on to show patterns in diversity and biogeographical affinity for the Odonata fauna in this region. He summarized the ranges of each species in the region with regards to compass direction. He showed that further compass analysis revealed the predominant biogeographical pattern for dragonflies in this region is to have affinities with more eastern and widespread distributions. He compared the diversity of Odonata within the region to caddisflies (Trichoptera) and butterflies (Lepidoptera). He also compared the diversity of Odonata in the conterminous U.S. with that of breeding birds, and described differences in these apparent patterns. He found that there is no strong correlation between land area and species diversity of Odonata within the south-central or conterminous U.S., but found those areas where aquatic systems and topographic heterogeneity are the greatest provide a broader spectrum of potential Odonata habitats and thus support a greater number of Odonata species. He suggested then that a small area (or state) that has been well-studied may support as many species as larger well-studied areas (or states).

William J. Cromartie, Corresponding Secretary